

Appendix E

Preliminary Cost Estimates

Route 54 Expressway
Job No. J5P0781
Preliminary Cost Estimate



ALTERNATIVE A1

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
RIGHT OF WAY COSTS					
Land and Improvements					
Land - Agricultural or Residential	acre	\$2,500	Vacant land; poor terrain	52.8	\$132,000
Land - Residential	acre	\$35,000	Developed land; decent terrain	6.9	\$241,500
Land - Commercial (fronting Route 54)	front foot	\$1,500	Land costs for parcels fronting Route 54	3,368	\$5,052,000
Land - Commercial	acre	\$5,000	Commercial land; not on 54; poor terrain	58.2	\$291,000
Land - Commercial	acre	\$40,000	Commercial land; not on 54; decent terrain	5.2	\$208,000
Improvements - Residential-SF	each	\$150,000	Cost of the improvement	5	\$750,000
Improvements - Residential-MF	each	\$175,000	Cost of the improvement	0	\$0
Improvements - Commercial	each	\$250,000	Cost of the improvement	21	\$5,250,000
Hazardous Materials Removal	per site	\$75,000	Costs to acquire and clean up a site	6	\$450,000
Outdoor Advertising Removal	each	\$30,000	Costs to remove a billboard-type sign	1	\$30,000
Total Costs for Land and Improvements					\$12,404,500
Utility Relocations					
Along New Alignment	mile	\$50,000	Costs of relocating utilities along corridor	1.83	\$91,500
Total Utility Relocation Costs					\$91,500
Total Right of Way Costs					\$12,496,000

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ALTERNATIVE A1

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
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ROADWAY CONSTRUCTION COSTS

Grading and Drainage

Clearing and Grubbing	acre	\$2,000	Tree and stump removal in forested areas	90.2	\$180,400
Unclassified Excavation	cu yd		Total Excavation Quantities (on site)	1,276,756	
- Class A Excavation	cu yd	\$2.00	Assume 70% of the unclassified excav.	893,729	\$1,787,458
- Class C Excavation	cu yd	\$5.00	Assume 30% of the unclassified excav.	383,027	\$1,915,134
Compacting Embankment	cu yd	\$0.40	Costs for the placement of fill	2,465,744	\$986,298
Borrow (Embankment - Excavation)	cu yd	\$1.50	Off-site excavation and hauling	1,188,988	\$1,783,482
Incidental Drainage - Expressway	mile	\$250,000	Smaller diameter crossroad systems	1.83	\$457,500
Incidental Drainage - Local Road	mile	\$100,000	Smaller diameter crossroad systems	1.03	\$103,000
Major Drainage Structures	foot	\$2,500	Drainage structures larger than 5 X 5	1,160	\$2,900,000
Erosion Control	mile	\$200,000	Sodding, seeding, ditch checks	1.83	\$366,000
Fence	lin ft	\$7.50	Right of way fencing	19,000	\$142,500

Total Grading and Drainage Costs

\$10,621,772

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ALTERNATIVE A1

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
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Surfacing - Pavement, Shoulders & Base

Heavy Duty - 5-Lane Urban Section (Business 54 Re-Alignment)	sq yd	\$50	5- 12-ft Lanes with 2- 10-ft Outside Shoulders; 12" Non-Reinforced Pavement on a Type 5 Base	19,467	\$973,350
Heavy Duty - 4-Lane Divided	sq yd	\$50	4- 12-ft Lanes with 2- 10-ft Outside Shoulders and 2- 4-ft Inside Shoulders; 12" Non-Reinforced Pavement on a 4" Type 5 Base	85,982	\$4,299,100
Heavy Duty - 3-Lane Urban Section (One-Way Couple Pavement)	sq yd	\$45	3- 12-ft Lanes with 2- 10-ft Outside Shoulders; 12" Non-Reinforced Pavement on a Type 5 Base	28,933	\$1,301,985
Light Duty - 2-Lane Local Road	sq yd	\$40	2- 12-ft Lanes with 2- 6-ft Asph. Shoulders; 12" Non-Reinforced Pavement on a 4" Type 5 Base	21,840	\$873,600
Total Pavement, Shoulders & Base Costs					\$7,448,035

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ALTERNATIVE A1

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
Interchanges (Excluding Bridges)					
<i>Route 54 Expressway and Business 54</i>					
Ramp: SB Expressway to WB Bus. 54	foot	\$500	Costs per foot of ramp include earthwork, drainage, and surfacing to construct the ramp	580	\$290,000
Ramp: EB Bus. 54 to SB Expressway	foot	\$500		1,055	\$527,500
Ramp: NB Expressway to WB Bus. 54	foot	\$500		1,270	\$635,000
Ramp: SB Expressway to Route 54	foot	\$500		1,280	\$640,000
Ramp: Bus. 54 to NB Expressway	foot	\$500		1,670	\$835,000
<i>Route 54 Expressway and Route 54 Couple</i>					
Ramp: SB Expressway to Route 54	foot	\$500		1,260	\$630,000
Ramp: Route 54 to SB Expressway	foot	\$500		1,260	\$630,000
Ramp: NB Expressway to Route 54	foot	\$500		1,210	\$605,000
Ramp: Route 54 to NB Expressway	foot	\$500		1,150	\$575,000
Lighting	interchange	\$500,000	Costs per interchange for lighting	2	\$1,000,000
Total Interchange Costs					\$6,367,500
Total Roadway Construction Costs					\$24,437,307
Grading & Drainage + Surfacing + Interchanges					

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ALTERNATIVE A1

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
BRIDGE CONSTRUCTION COSTS					
Bridges					
Relocated Business 54 over expressway	sq ft	\$80	Costs for construction of bridge	26,650	\$2,132,000
Relocated Business 54 over SB ramp	sq ft	\$80	Costs for construction of bridge	9,020	\$721,600
SB ramp over expressway	sq ft	\$80	Costs for construction of bridge	11,200	\$896,000
Mace Road over expressway	sq ft	\$80	Costs for construction of bridge	10,120	\$809,600
Route 42 over Route 54 couple	sq ft	\$80	Costs for construction of bridge	9,440	\$755,200
Route 54 WB over expressway	sq ft	\$80	Costs for construction of bridge	14,000	\$1,120,000
Route 54 EB over expressway	sq ft	\$80	Costs for construction of bridge	15,400	\$1,232,000
Total Bridge Costs					\$7,666,400
TOTAL CONSTRUCTION COSTS					
Total Roadway and Bridge Construction Costs					\$32,103,707

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ALTERNATIVE A1

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
Miscellaneous					
Maintenance of Traffic During Construction		12%	% of Total Roadway Costs (excl. bridges)		\$2,932,477
Mobilization		4%	% of Total Roadway Costs (excl. bridges)		\$977,492
Traffic Control (Permanent Items)		4%	% of Total Roadway Costs (excl. bridges)		\$977,492
Construction Staking		2%	% of Construction Costs		\$642,074
Engineering - Design		6%	% of Construction Costs		\$1,926,222
Construction Inspection		4%	% of Construction Costs		\$1,284,148
Contingency		10%	% of Construction Costs		\$3,210,371
Total Miscellaneous Costs					\$11,950,277

Total Costs					
Right of Way					\$12,496,000
Roadway					\$24,437,307
Bridge					\$7,666,400
Miscellaneous					\$11,950,277
Grand Total					\$56,549,984

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ALTERNATIVE A2

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
RIGHT OF WAY COSTS					
Land and Improvements					
Land - Agricultural or Residential	acre	\$2,500	Vacant land; poor terrain	27.2	\$68,000
Land - Residential	acre	\$35,000	Developed land; decent terrain	0	\$0
Land - Commercial (fronting Route 54)	front foot	\$1,500	Land costs for parcels fronting Route 54	3,728	\$5,592,000
Land - Commercial	acre	\$5,000	Commercial land; not on 54; poor terrain	80.5	\$402,500
Land - Commercial	acre	\$40,000	Commercial land; not on 54; decent terrain	10.7	\$428,000
Improvements - Residential-SF	each	\$150,000	Cost of the improvement	1	\$150,000
Improvements - Residential-MF	each	\$175,000	Cost of the improvement	8	\$1,400,000
Improvements - Commercial	each	\$250,000	Cost of the improvement	23	\$5,750,000
Hazardous Materials Removal	per site	\$100,000	Costs to acquire and clean up a site	4	\$400,000
Outdoor Advertising Removal	each	\$30,000	Costs to remove a billboard-type sign	1	\$30,000
Total Costs for Land and Improvements					\$14,220,500
Utility Relocations					
Along New Alignment	mile	\$50,000	Costs of relocating utilities along corridor	1.80	\$90,000
Total Utility Relocation Costs					\$90,000
Total Right of Way Costs					\$14,310,500

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ALTERNATIVE A2

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
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ROADWAY CONSTRUCTION COSTS

Grading and Drainage

Clearing and Grubbing	acre	\$2,000	Tree and stump removal in forested areas	84.3	\$168,600
Unclassified Excavation	cu yd		Total Excavation Quantities (on site)	1,715,567	
- Class A Excavation	cu yd	\$2.00	Assume 70% of the unclassified excav.	1,200,897	\$2,401,794
- Class C Excavation	cu yd	\$5.00	Assume 30% of the unclassified excav.	514,670	\$2,573,351
Compacting Embankment	cu yd	\$0.40		2,030,815	\$812,326
Borrow (Embankment - Excavation)	cu yd	\$1.50	Off-site excavation and hauling	315,248	\$472,872
Incidental Drainage - Expressway	mile	\$250,000	Smaller diameter crossroad systems	1.80	\$450,000
Incidental Drainage - Local Road	mile	\$100,000	Smaller diameter crossroad systems	0.91	\$91,000
Major Drainage Structures	foot	\$2,500	Drainage structures larger than 5 X 5	1,180	\$2,950,000
Erosion Control	mile	\$200,000	Sodding, seeding, ditch checks	1.80	\$360,000
Fence	lin ft	\$7.50	Right of way fencing	18,500	\$138,750

Total Grading and Drainage Costs

\$10,418,692

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ALTERNATIVE A2

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
Surfacing - Pavement, Shoulders & Base					
Heavy Duty - 5-Lane Urban Section (Business 54 Re-Alignment)	sq yd	\$50	5- 12-ft Lanes with 2- 10-ft Outside Shoulders; 12" Non-Reinforced Pavement on a Type 5 Base	19,467	\$973,350
Heavy Duty - 4-Lane Divided	sq yd	\$50	4- 12-ft Lanes with 2- 10-ft Outside Shoulders and 2- 4-ft Inside Shoulders; 12" Non-Reinforced Pavement on a 4" Type 5 Base	84,258	\$4,212,900
Heavy Duty - 3-Lane Urban Section (One-Way Couple Pavement)	sq yd	\$45	3- 12-ft Lanes with 2- 10-ft Outside Shoulders; 12" Non-Reinforced Pavement on a Type 5 Base	28,933	\$1,301,985
Light Duty - 2-Lane Local Road	sq yd	\$40	2- 12-ft Lanes with 2- 6-ft Asph. Shoulders; 12" Non-Reinforced Pavement on a 4" Type 5 Base	19,280	\$771,200
Total Pavement, Shoulders & Base Costs					\$7,259,435

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ALTERNATIVE A2

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
Interchanges (Excluding Bridges)					
<i>Route 54 Expressway and Business 54</i>					
Ramp: SB Expressway to WB Bus. 54	foot	\$500	Costs per foot of ramp include earthwork, drainage, and surfacing to construct the ramp	580	\$290,000
Ramp: EB Bus. 54 to SB Expressway	foot	\$500		1,070	\$535,000
Ramp: NB Expressway to WB Bus. 54	foot	\$500		1,470	\$735,000
Ramp: SB Expressway to Route 54	foot	\$500		920	\$460,000
Ramp: Bus. 54 to NB Expressway	foot	\$500		1,870	\$935,000
<i>Route 54 Expressway and Route 54 Couple</i>					
Ramp: SB Expressway to Route 54	foot	\$500		1,260	\$630,000
Ramp: Route 54 to SB Expressway	foot	\$500		1,260	\$630,000
Ramp: NB Expressway to Route 54	foot	\$500		1,210	\$605,000
Ramp: Route 54 to NB Expressway	foot	\$500		1,150	\$575,000
Lighting	interchange	\$500,000	Costs per interchange for lighting	2	\$1,000,000
Total Interchange Costs					\$6,395,000
Total Roadway Construction Costs					\$24,073,127
Grading & Drainage + Surfacing + Interchanges					

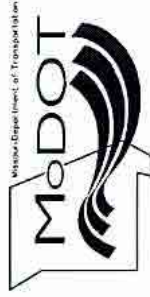
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ALTERNATIVE A2

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
BRIDGE CONSTRUCTION COSTS					
Bridges					
Relocated Business 54 over expressway	sq ft	\$80	Costs for construction of bridge	69,700	\$5,576,000
WB ramp over expressway	sq ft	\$80	Costs for construction of bridge	26,000	\$2,080,000
Mace Road over expressway	sq ft	\$80	Costs for construction of bridge	23,760	\$1,900,800
Route 42 over Route 54 couple	sq ft	\$80	Costs for construction of bridge	9,440	\$755,200
Route 54 WB over expressway	sq ft	\$80	Costs for construction of bridge	14,000	\$1,120,000
Route 54 EB over expressway	sq ft	\$80	Costs for construction of bridge	15,400	\$1,232,000
Total Bridge Costs					\$12,664,000
TOTAL CONSTRUCTION COSTS					
Total Roadway and Bridge Construction Costs					\$36,737,127

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ALTERNATIVE A2

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
Miscellaneous					
Maintenance of Traffic During Construction		12%	% of Total Roadway Costs (excl. bridges)		\$2,888,775
Mobilization		4%	% of Total Roadway Costs (excl. bridges)		\$962,925
Traffic Control (Permanent Items)		4%	% of Total Roadway Costs (excl. bridges)		\$962,925
Construction Staking		2%	% of Construction Costs		\$734,743
Engineering - Design		6%	% of Construction Costs		\$2,204,228
Construction Inspection		4%	% of Construction Costs		\$1,469,485
Contingency		10%	% of Construction Costs		\$3,673,713
Total Miscellaneous Costs					\$12,896,793
Total Costs					
Right of Way					\$14,310,500
Roadway					\$24,073,127
Bridge					\$12,664,000
Miscellaneous					\$12,896,793
Grand Total					\$63,944,421

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ALTERNATIVE C'

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
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RIGHT OF WAY COSTS

Land and Improvements					
Land - Agricultural or Residential	acre	\$2,500	Vacant land; poor terrain	28.2	\$70,500
Land - Residential	acre	\$35,000	Developed land; decent terrain	0	\$0
Land - Commercial (fronting Route 54)	front foot	\$1,500	Land costs for parcels fronting Route 54	2,842	\$4,263,000
Land - Commercial	acre	\$5,000	Commercial land; not on 54; poor terrain	150.84	\$754,200
Land - Commercial	acre	\$40,000	Commercial land; not on 54; decent terrain	5.14	\$205,600
Improvements - Residential-SF	each	\$150,000	Cost of the improvement	0	\$0
Improvements - Residential-MF	each	\$175,000	Cost of the improvement	0	\$0
Improvements - Commercial	each	\$250,000	Cost of the improvement	16	\$4,000,000
Hazardous Materials Removal	per site	\$100,000	Costs to acquire and clean up a site	7	\$700,000
Outdoor Advertising Removal	each	\$30,000	Costs to remove a billboard-type sign	2	\$60,000
Total Costs Land and Improvements					\$10,053,300
Utility Relocations					
Along New Alignment	mile	\$50,000	Costs of relocating utilities along corridor	2.02	\$101,000
Total Utility Relocation Costs					\$101,000
Total Right of Way Costs					\$10,154,300

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ALTERNATIVE C'

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
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ROADWAY CONSTRUCTION COSTS

Grading and Drainage

Clearing and Grubbing	acre	\$2,000	Tree and stump removal in forested areas	116.4	\$232,800
Unclassified Excavation	cu yd		Total Excavation Quantities (on site)	1,420,990	
- Class A Excavation	cu yd	\$2.00	Assume 70% of the total excavation	994,693	\$1,989,386
- Class C Excavation	cu yd	\$5.00	Assume 30% of the total excavation	426,297	\$2,131,485
Compacting Embankment	cu yd	\$0.40		2,713,598	\$1,085,439
Borrow	cu yd	\$1.50	Off-site excavation and hauling	1,292,608	\$1,938,912
Incidental Drainage - Expressway	mile	\$250,000	Smaller diameter crossroad systems	2.02	\$505,000
Incidental Drainage - Local Road	mile	\$100,000	Smaller diameter crossroad systems	0.86	\$86,000
Major Drainage Structures	foot	\$2,500	Drainage structures larger than 5 X 5	1,065	\$2,662,500
Erosion Control	mile	\$200,000	Sodding, seeding, ditch checks	2.02	\$404,000
Fence	lin ft	\$7.50	Right of way fencing	19,750	\$148,125

Total Grading and Drainage Costs

\$11,183,647

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ALTERNATIVE C'

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
Surfacing - Pavement, Shoulders & Base					
Heavy Duty - 5-Lane Urban Section (Business 54 Re-Alignment)	sq yd	\$50	5- 12-ft Lanes with 2- 10-ft Outside Shoulders; 12" Non-Reinforced Pavement on a 4" Type 5 Base	19,467	\$973,350
Heavy Duty - 4-Lane Divided	sq yd	\$50	4- 12-ft Lanes with 2- 10-ft Outside Shoulders and 2- 4-ft Inside Shoulders; 12" Non-Reinforced Pavement on a 4" Type 5 Base	94,862	\$4,743,100
Heavy Duty - 3-Lane Urban Section (One-Way Couple Pavement)	sq yd	\$45	3- 12-ft Lanes with 2- 10-ft Outside Shoulders; 12" Non-Reinforced Pavement on a 4" Type 5 Base	28,933	\$1,301,985
Light Duty - 2-Lane Local Road	sq yd	\$40	2- 12-ft Lanes with 2- 6-ft Asph. Shoulders; 12" Non-Reinforced Pavement on a 4" Type 5 Base	18,080	\$723,200
Total Pavement, Shoulders & Base Costs					\$7,741,635

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ALTERNATIVE C'

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
Interchanges (Excluding Bridges)					
<i>Route 54 Expressway and Business 54</i>					
Ramp: SB Expressway to WB Bus. 54	foot	\$500	Costs per foot of ramp include earthwork, drainage, and surfacing to construct the ramp <div>↓</div>	385	\$192,500
Ramp: EB Bus. 54 to SB Expressway	foot	\$500		1,965	\$982,500
Ramp: NB Expressway to WB Bus. 54	foot	\$500		1,690	\$845,000
Ramp: SB Expressway to Route 54	foot	\$500		815	\$407,500
Ramp: Bus. 54 to NB Expressway	foot	\$500		2,250	\$1,125,000
<i>Route 54 Expressway and Route 54 Couple</i>					
Ramp: SB Expressway to Route 54	foot	\$500		1,260	\$630,000
Ramp: Route 54 to SB Expressway	foot	\$500		1,260	\$630,000
Ramp: NB Expressway to Route 54	foot	\$500		1,210	\$605,000
Ramp: Route 54 to NB Expressway	foot	\$500		1,150	\$575,000
Lighting	interchange	\$500,000	Costs per interchange for lighting	2	\$1,000,000
Total Interchange Costs					\$6,992,500
Total Roadway Construction Costs					\$25,917,782
Grading & Drainage + Surfacing + Interchanges					

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ALTERNATIVE C'

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
BRIDGE CONSTRUCTION COSTS					
Bridges					
Ramp to/from Bus. 54 over expressway	sq ft	\$80	Costs for construction of bridge	34,580	\$2,766,400
Relocated Business 54 over SB ramp	sq ft	\$80	Costs for construction of bridge	18,480	\$1,478,400
SB ramp over WB ramp	sq ft	\$80	Costs for construction of bridge	13,250	\$1,060,000
Route 54 over expressway near Opry	sq ft	\$80	Costs for construction of bridge	22,040	\$1,763,200
Route 42 over Route 54 couple	sq ft	\$80	Costs for construction of bridge	9,440	\$755,200
Route 54 WB over expressway	sq ft	\$80	Costs for construction of bridge	14,000	\$1,120,000
Route 54 EB over expressway	sq ft	\$80	Costs for construction of bridge	15,400	\$1,232,000
Total Bridge Costs					\$10,175,200
TOTAL CONSTRUCTION COSTS					
Total Roadway and Bridge Construction Costs					\$36,092,982

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ALTERNATIVE C'

Item	Unit	\$ / Unit or % Const.	Item Description	Quantity	Total Cost
Miscellaneous					
Maintenance of Traffic During Construction		6%	% of Total Roadway Costs (excl. bridges)		\$1,555,067
Mobilization		4%	% of Total Roadway Costs (excl. bridges)		\$1,036,711
Traffic Control (Permanent Items)		4%	% of Total Roadway Costs (excl. bridges)		\$1,036,711
Construction Staking		2%	% of Construction Costs		\$721,860
Engineering - Design		6%	% of Construction Costs		\$2,165,579
Construction Inspection		4%	% of Construction Costs		\$1,443,719
Contingency		10%	% of Construction Costs		\$3,609,298
Total Miscellaneous Costs					\$11,568,946
Total Costs					
Right of Way					\$10,154,300
Roadway					\$25,917,782
Bridge					\$10,175,200
Miscellaneous					\$11,568,946
Grand Total					\$57,816,228